

REMARKS

The Office Action dated March 18, 2010 has been received and carefully studied.

The Examiner newly rejects claims 1-2, 8-16, 18-20 and 22 under 35 U.S.C. §103(a) as being unpatentable over Zucker in view of Abbe et al., U.S. Patent No. 3,159,507; claims 3-6 as being unpatentable over Zucker in view of Abbe et al. and further in view of Kawai et al.; claim 7 as being unpatentable over Zucker in view of Abbe et al. and further in view of Farahmandi et al., claim 17 as being unpatentable over Zucker in view of Abbe et al. and further in view of Kawai et al.; and claim 21 as being unpatentable over Zucker in view of Abbe et al. and further in view of Bohnstedt.

The Examiner states that Zucker teaches a separator material for forming a separator for a lead-acid accumulator/battery wherein the material comprises the first and second layers set forth in the instant claims. The Examiner admits that Zucker does not teach that the second layer is located on a face of the first layer/microporous sheet having such protrusions or that the second layer is located at least at the level of the surface of the first layer/base sheet in the area of the weld joints and does not penetrate into this. The Examiner cites Abbe et al. as disclosing a separator having a first layer in the form of a microporous sheet made of glass fibers and a synthetic resin of hydrophilic character and having a number of protrusions/ribs, each defining an area of increased thickness, on at least one face of a base

sheet, and a second layer in the form of a planar fleece material which is located on a face of the microporous sheet. The Examiner adds that the planar fleece is bonded to at least some of the protrusions/ribs, and Fig. 7 shows that the fleece material can be located at least at the level of the surface of the base sheet in the area of the welded/fused joints and does not penetrate into this. The Examiner concludes that in view of Abbe et al., it would have been obvious to locate the second layer of Zucker on a face of the first layer where the second layer is located at least at the level of the surface of the first layer in the area of the weld joints and does not penetrate into this.

By the accompanying amendment, the limitations of claim 2 have been incorporated into claim 1. Claim 2 has been canceled.

The rejections are respectfully traversed.

As set forth in previous responses, from a technical perspective the skilled artisan would not have combined Abbe and Zucker to arrive at the present invention for the simple reason that Abbe is explicit in its limitation to provide a battery separator made wholly of glass fibers, whereas in contrast thereto, the present invention relates to a separator material for forming a separator for a lead-acid accumulator wherein the separator material comprises a first layer in the form of a microporous sheet, which is made of a thermoplastic.

The Examiner acknowledges on page 3, last two lines and page 4, first two lines, that Zucker:

"fails to teach that the second layer is located on a

face of the first layer/microporous sheet having the protrusions or that the second layer is located at at least the level of the surface of the first layer/base sheet in the area of the weld joints and does not penetrate into this."

Indeed, Zucker does not explicitly disclose that the fleece material is placed on the face of the microporous layer which has protrusions. According to the inventors, the fleece material would penetrate into the microporous layer in the area of the welded joints if the latter were created by placing the fleece material onto the base sheet. Such penetration can only be avoided by placing the fleece material onto one or more protrusions of the film and by welding the fleece material in the protrusions, as now recited in the amended claim 1.

On page 4, second paragraph of the Office Action, the Examiner refers to the teaching in Abbe in column 5, lines 11-16 of a microporous sheet that "can be made of glass fibers and a synthetic resin of hydrophilic character". Applicants respectfully submit that this quotation from Abbe is truncated and is therefore misleading insofar as the actual teaching in Abbe in this passage is that the:

"union obtained by initial fusion of the glass fibers may be reinforced by impregnation of the separator with an appropriate synthetic resin of hydrophilic character in order to avoid delay of the wetting of the separator by the electrolyte of the galvanic cell. However, it is understood that the invention may be fulfilled by the structure constituted entirely and solely of glass fibers."

This teaching of impregnation of glass fibers with hydrophilic resin would not have guided the skilled artisan towards the

present invention. It is also contrary to other explicit statements in Abbe to the effect that the separator is made wholly of glass fibers, such as at column 2, lines 30-36:

"Still another object of this invention is to provide an improved battery separator of the aforementioned type which is made of a single type of material and which is so formed as to be a self-supporting structure which will retain its general configuration, while at the same time provide a desired amount of resiliency in the direction perpendicular to the faces of the separator." (Emphasis added.)

And at column 2, lines 37-41:

"Still another object of this invention is to provide a battery separator made wholly of glass fibers and including a plurality of juxtaposed layers of relatively rigid microporous agglomerated fibers and a relatively more porous and more resilient layer of fibers." (Emphasis added.)

And in claims 1 and 3:

"the separator consists entirely and solely of glass fibers agglomerated by partial fusion".

Moreover, *impregnating* the glass fibers with hydrophilic resin does not result in a separator having a first layer in the form of a microporous sheet made of a thermoplastic, as required by the instant claims. Applicants also note that the amount and identity of such hydrophilic resin is not mentioned or enabled, by Abbe, nor is any method of impregnation.

Accordingly, the skilled artisan would not be motivated to modify Zucker in view of Abbe.

Neither Kawai et al. nor Farahmandi et al. nor Bohnstedt supplies the deficiencies of Zucker and Abbe.

New claims 23-25 have been added to further define the invention. Support for claim 23 can be found on page 7 of the specification. Neither Zucker nor Abbe, alone or in combination, discloses or suggests that the step of welding of the at least one planar fleece material with at least some of the protrusions of the sheet causes at least some of the protrusions to disappear completely during the welding process. Support for claims 24-25 can be found in the paragraph bridging pages 9-10. Neither Zucker nor Abbe, alone or in combination, discloses or suggests gradually laying one of said at least one planar fleece material and said sheet having protrusions on the other in sections or continuously.

Reconsideration and allowance are respectfully requested in view of the foregoing.

Respectfully submitted,

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